The arrival of back vowel fronting in New York City English

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CUNY Sociolinguistics Lunch
5/4/2019
Slides: tiny.cc/backvowels

Vowel fronting in four lexical sets

- **Focus:** Back vowel fronting (BVF). In particular fronting of vowels in TOO, HOOP, GOAT and FOOT lexical sets.
- For /u/, three allophonic contexts distinguished.
  i. TOO. Following coronals: *shoe, cue.*
  ii. COOL. Preceding tautosyllabic /l/: *fool, pool.*
  iii. HOOP. Elsewhere: *coop, goo.*
- For N. Am. at least, dialects obey an implicational hierarchy for allophonic contexts:
  TOO > HOOP > COOL (Labov et al., 2005).
- Sometimes described as part of more general long-vowel fronting change including GOAT (Labov, 1994).
- Much less sharp allophonic difference for GOAT (Labov et al., 2005; Newman, 2014).

Diffusion of GOOSE/GOAT-fronting across English varieties

- UK varieties (Kerswill and Williams, 2005; Ferragne and Pellegrino, 2010; Haddican et al., 2013; Baranowski, 2014, 2017).
- N. Am. (Fought, 1999; Thomas, 2001; Fridland and Bartlett, 2006; Baranowski, 2008; Fridland, 2008; Hall-Lew, 2009; Koops, 2010; Podesva et al., 2015).

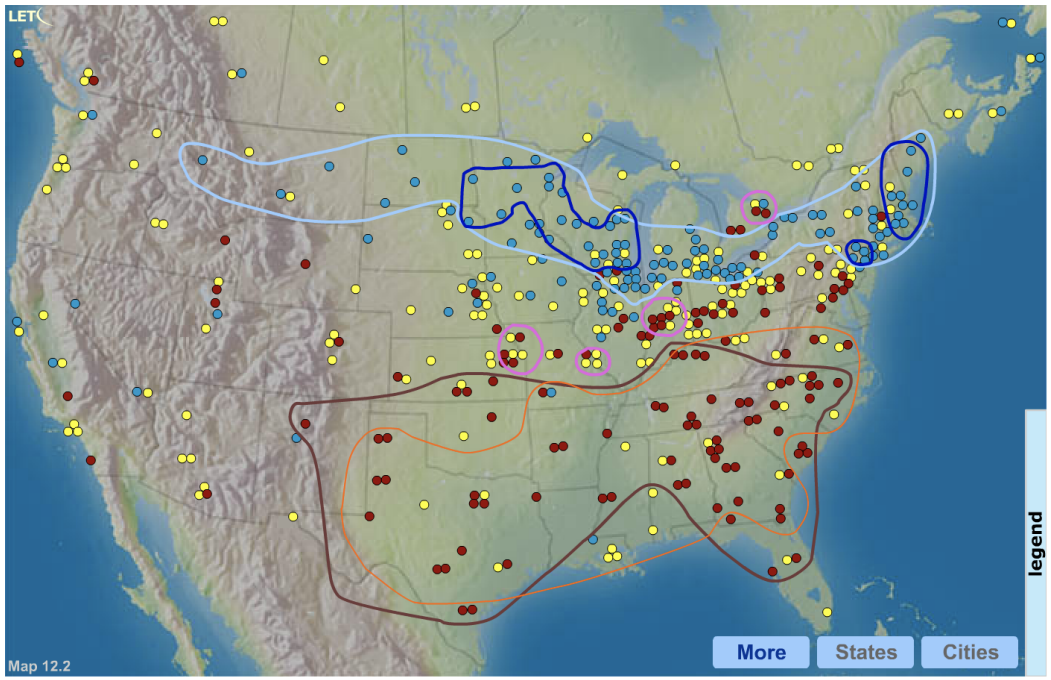

Figure 1: HOOP-fronting in N. Am. dialects. (Labov et al., 2005)

FOOT-fronting

- In some dialects described, BVF seems to apply only to long vowels, i.e. in GOOSE and GOAT sets (Labov, 1994; Labov et al., 2005).
- In some Western and Southern N. Am dialects, however, FOOT also fronts (Fridland and Bartlett, 2006; Eckert, 2008; Fridland, 2008; Hall-Lew, 2009; Podesva et al., 2015).

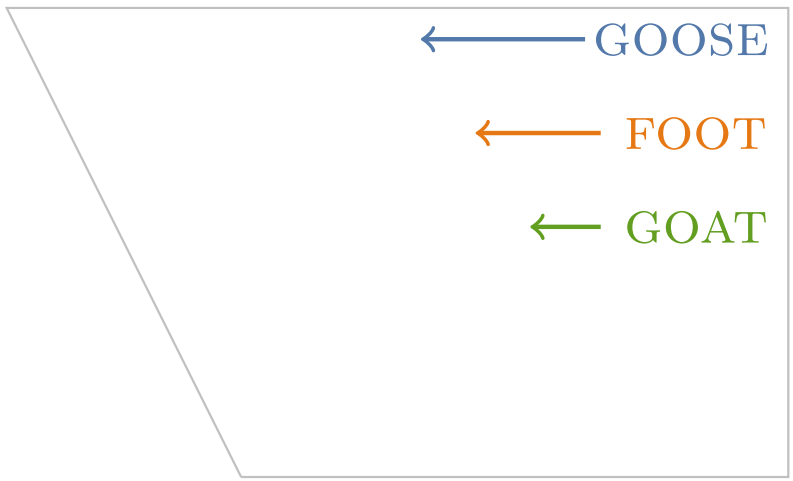

Figure 2: BVF in California Vowel Shift

Ethnicity

- Ethnic differentiation reported for some varieties.
- Fought (1999) reports some Chicanos not participating in GOOSE-fronting. (See also Godinez and Maddieson (1985).)
- African-American speakers sometimes reported to be behind Whites in fronting (Thomas, 2001; Fridland and Bartlett, 2006).
- Hall-Lew (2009), however, finds that San Francisco Asians participating in GOAT, GOOSE-fronting in a way very similar to SF Whites.

New York City English

- Newman (2014) reports fronting for TOO, particularly among Whites and Asians, and back variants in other contexts. (No controlled acoustic results reported.)
- Wong (2014) presents acoustic evidence suggesting HOOP fronting among Chinese Americans.
- Becker and Coggshall (2009) find no difference in fronting of nucleus for GOOSE between Af. Am. and White subjects.
- We are aware of no descriptions of fronting among Latinx groups.
- Traditional NYCE system reported to be conservative wrt GOAT (Labov et al., 2005; Newman, 2014).

Goals and main claims

- We describe an acoustic analysis of conversation data from 97 speakers recorded through the CoNYCE project (Tortora et al., in progress).
- ***Two main claims:***
  i. Fronting of vowels in TOO, HOOP, GOAT and FOOT lexical sets starting with speakers born > 1975.
  ii. Unlike in changes in short-a contexts, BVF shows no strong effects of class. No ethnicity effects with possible exception of Caribbean Latinx groups.

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Sample

- Data collected 2014-2019 as part of CoNYCE project (Tortora et al., in progress).
- 97 subjects, b. 1906-2001.
- 58 Women, 39 Men.

Figure 3: Subject home community

Sample

- Recordings transcribed and audio-aligned by student researchers, checked by research associates.
- 69,113 stressed vowels in four sets measured at 35% of duration using FAVE-Extract (Rosenfelder et al., 2014) and Prosodylab-Aligner (Gorman et al., 2011), via DARLA (Reddy and Stanford, 2015).
- Normalized using Watt & Fabricius' modified procedure (Fabricius et al., 2009).

A conservative back vowel system

- HOOP overlaps with COOL.
- Some fronting of TOO relative to back vowels.
- Back realizations for FOOT, GOAT.

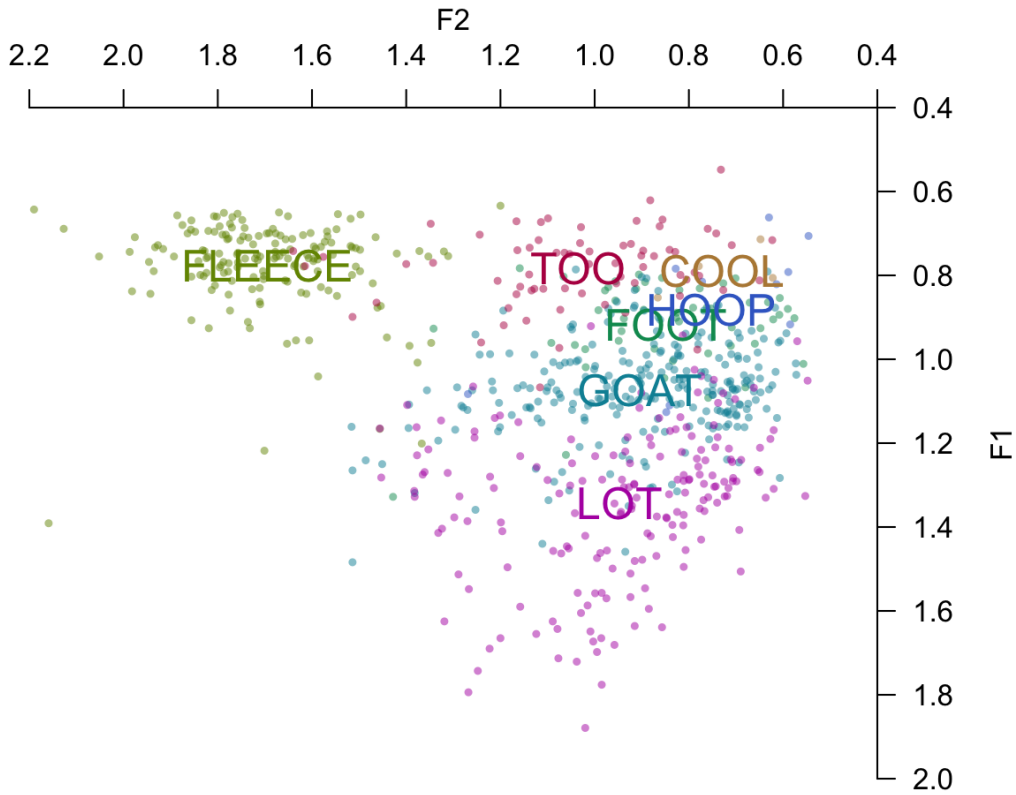

Figure 4: John Stugots, Ital.-Am., b. 1959

A fronted system

- TOO close to FLEECE.
- Some fronting of HOOP relative to COOL.
- Some fronting of FOOT, GOAT relative to LOT, COOL.

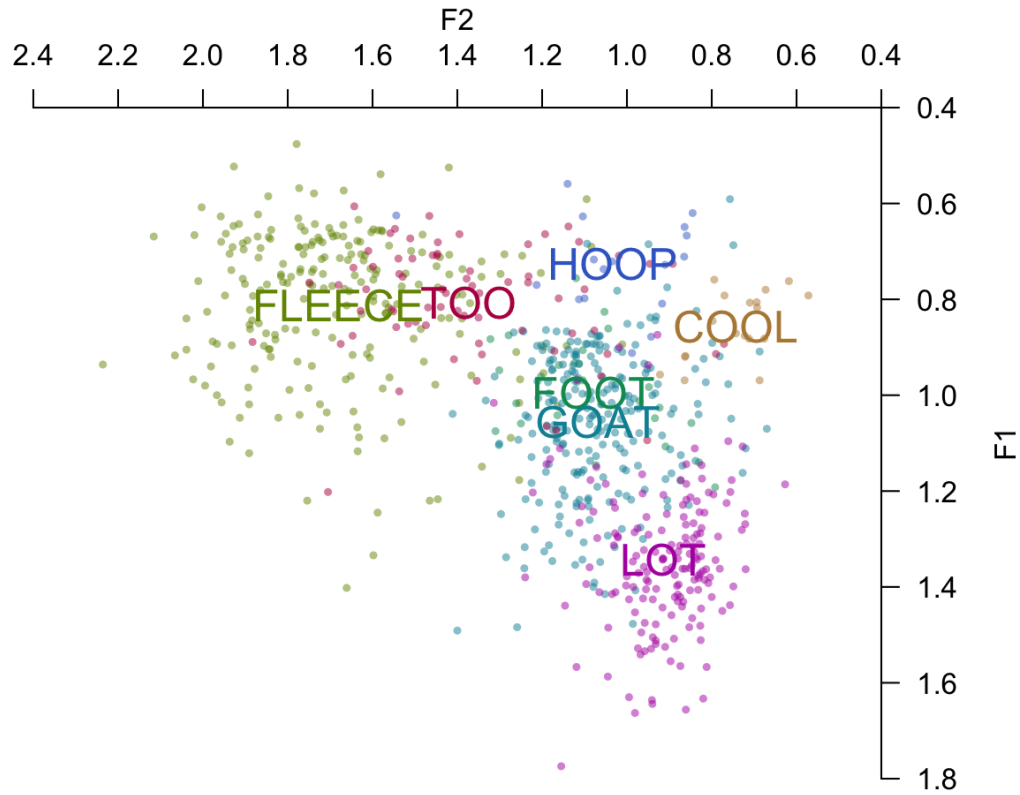

Figure 5: Sarah Rodgers, Chin.-Am., b. 1999

A non-linear effect of age

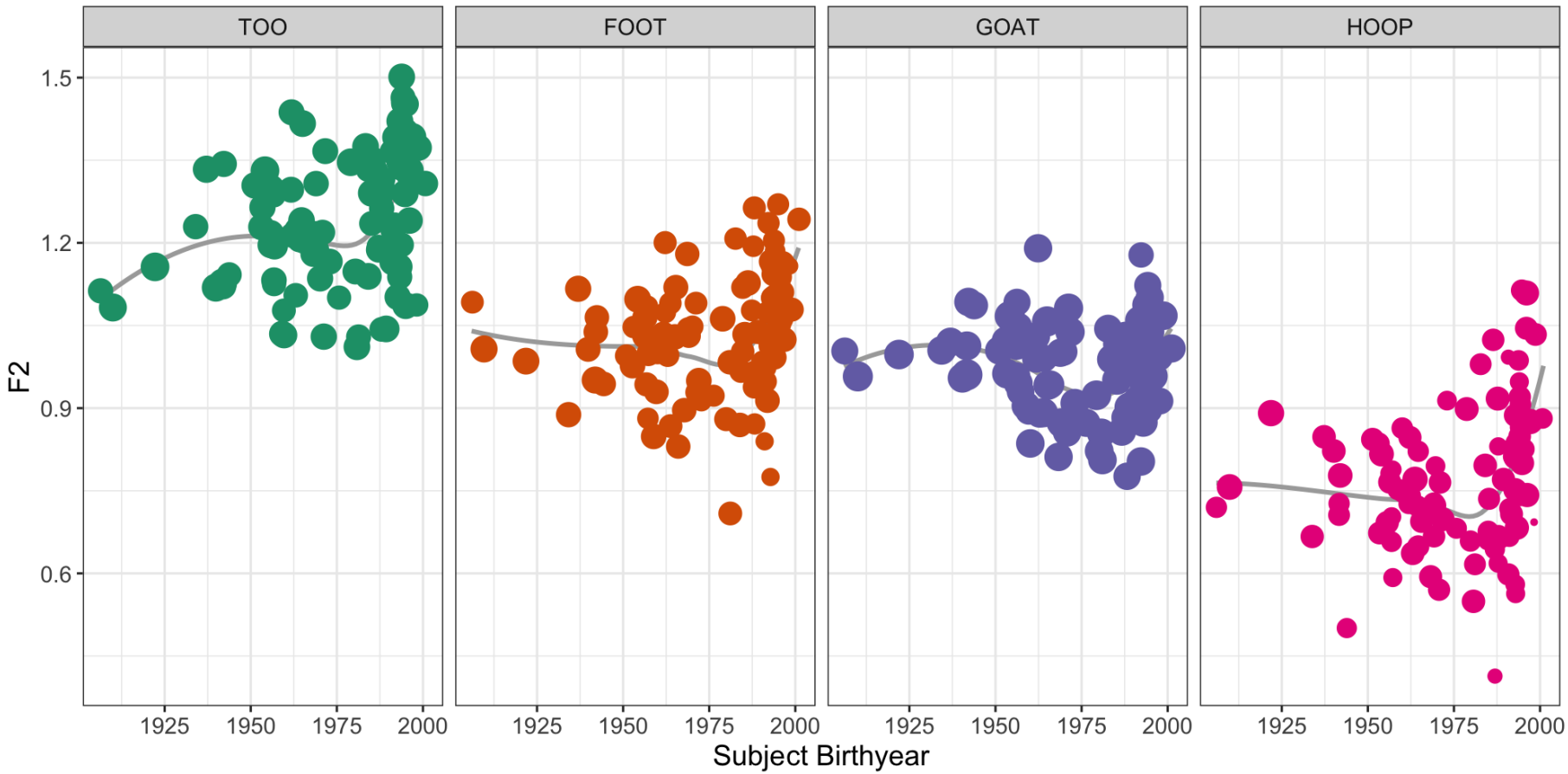

Figure 6: Normalized F2 by subject birthyear and lexical set

Generality of changes

- A question to be addressed is whether this is a single process of fronting (Labov, 1994; Watt, 2000; Baranowski, 2008; Hall-Lew, 2009; Haddican et al., 2013).
- Labov's principle III: GOAT fronting parasitic on GOOSE fronting.
- For younger subset, moderate-strong correlation across lexical sets.
- Among older speakers, HOOP-correlates much more weakly, again suggesting different processes of change for two subsets.
- For latter, aggregate backing of GOAT, GOOSE, FOOT correlates across speakers.

By-speaker correlations across lexical sets

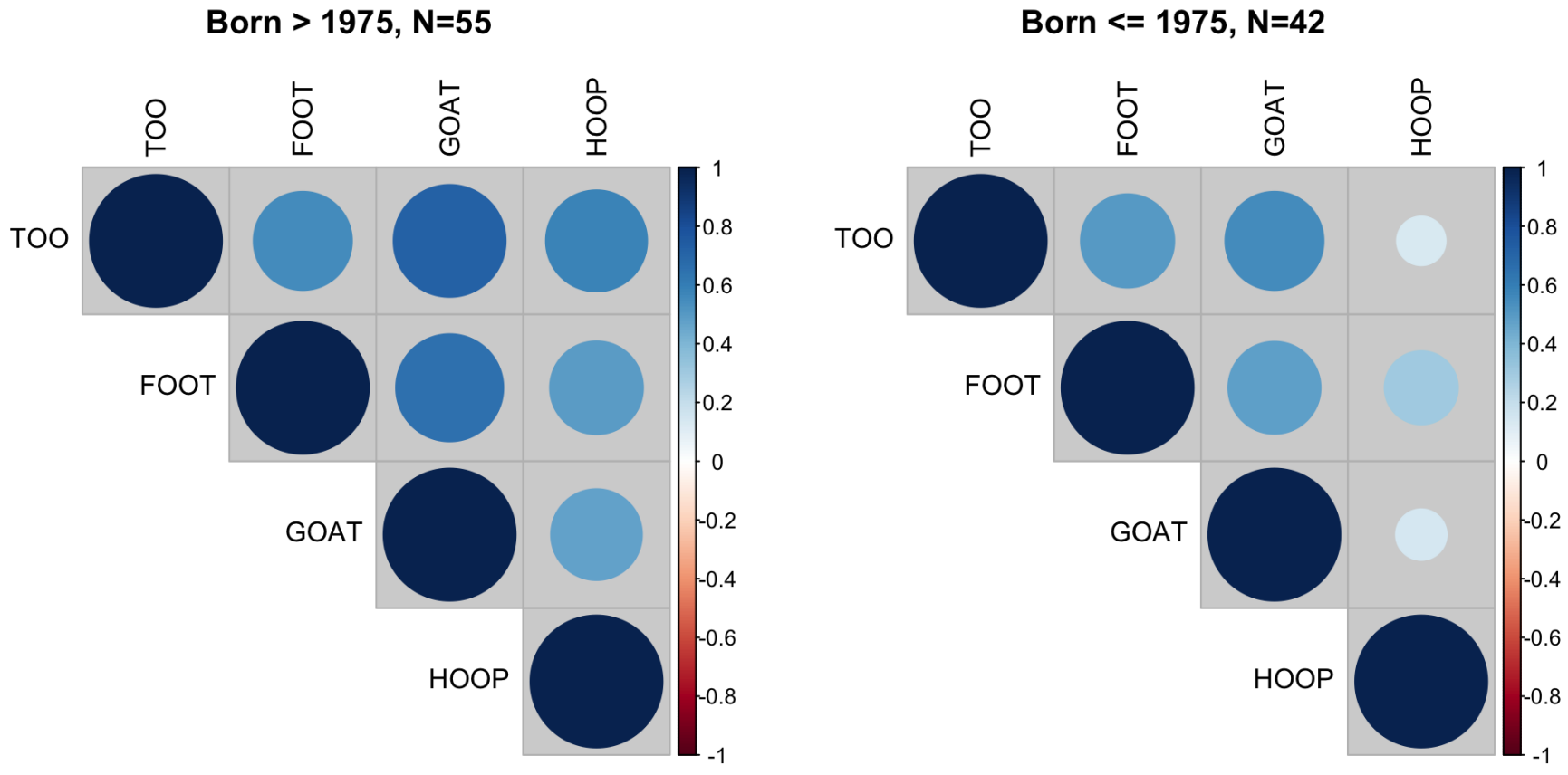

Figure 7: Spearman's ρ matrices for younger and older subjects.

A model of speakers born > 1975, N=55

Variable	**Coeff.**	**St. Err.**	***t***	***p***
Intercept	1.367	0.055	24.925	<.0001
Duration	0.110	0.037	2.932	.0034
Set:FOOT	-0.126	0.032	-3.912	<.0001
Set:GOAT	-0.315	0.021	-15.371	<.0001
Set:HOOP	-0.358	0.037	-9.600	<.0001
Age	-0.006	0.002	-3.551	.0008
Fol. sound([-Back])	0.013	0.006	2.112	.0347
Duration:FOOT	-0.922	0.144	-6.423	<.0001
Duration:GOAT	-0.164	0.042	-3.941	<.0001
Duration:HOOP	-0.245	0.081	-3.041	.0024

Table 1: Fixed effects from a model of F2. Reference level TOO for Set & [+Back] for Following Sound. Obs.=17,362.
(F2∼Set*Duration+Age+Following sound+(Set|Speaker)+(1|Root))

Subjects born > 1975

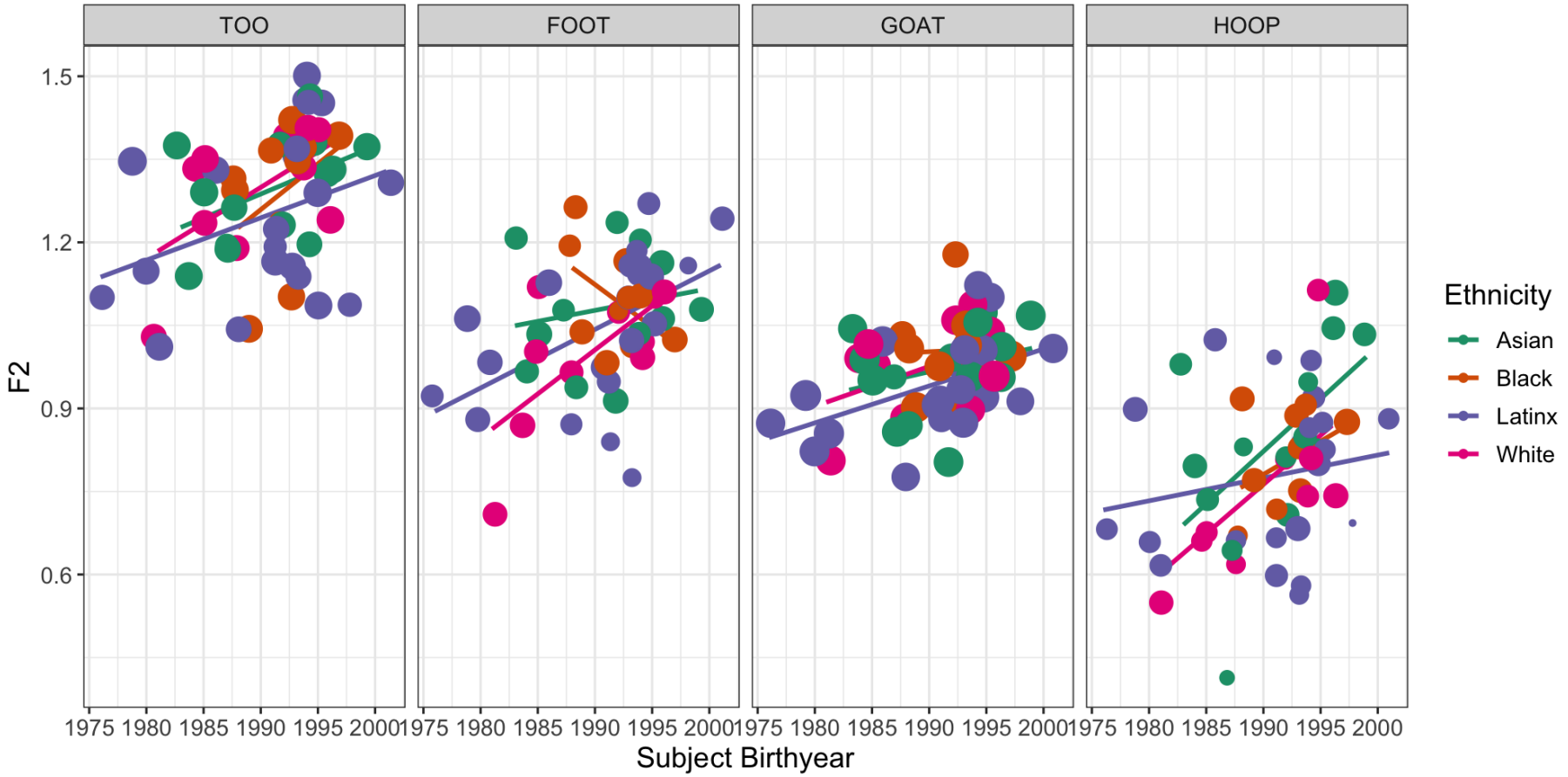

Figure 8: Normalized F2 by subject birthyear and lexical set

Variation among young Latinx speakers

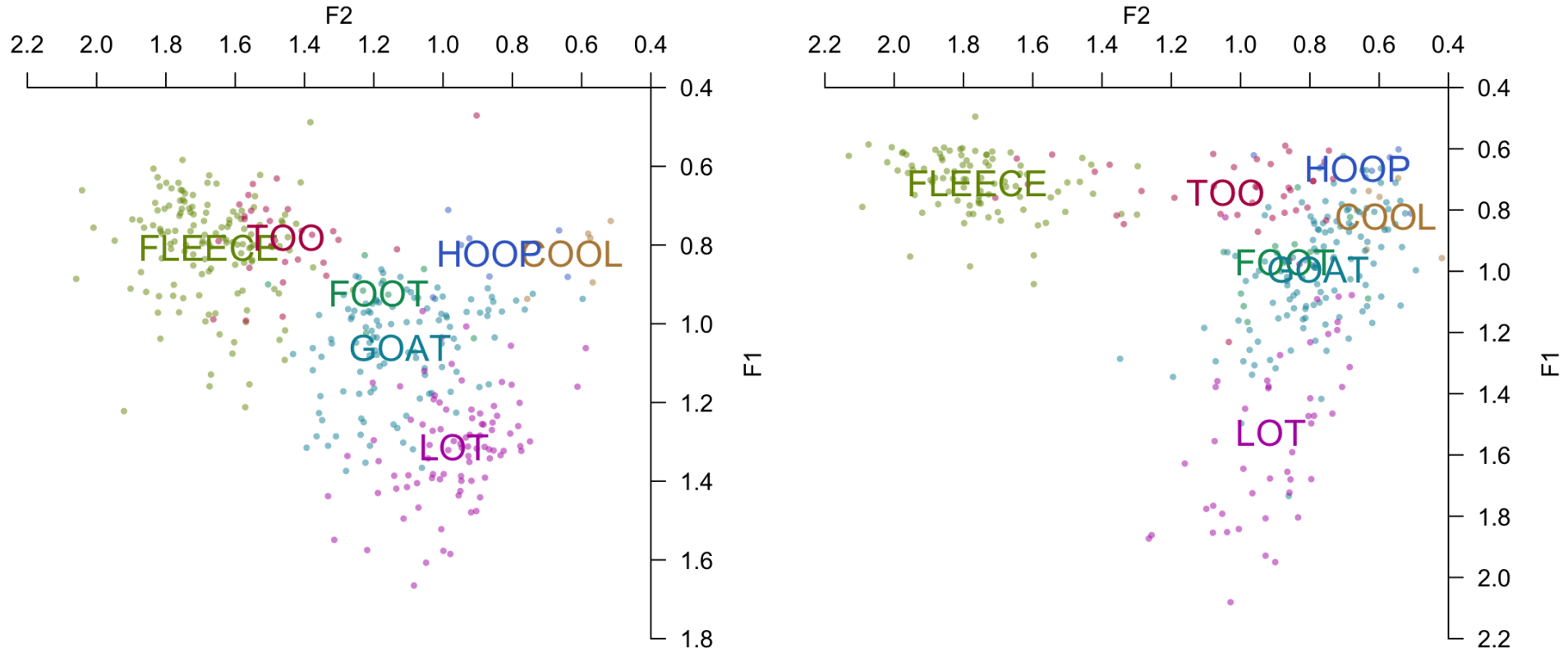

Figure 9: Left, Sophia Omelas, Latina, b. 1994. Right, Nicole Lopez, Latina, b. 1988.

Caribbean vs. Non-Caribbean Latinx Speakers

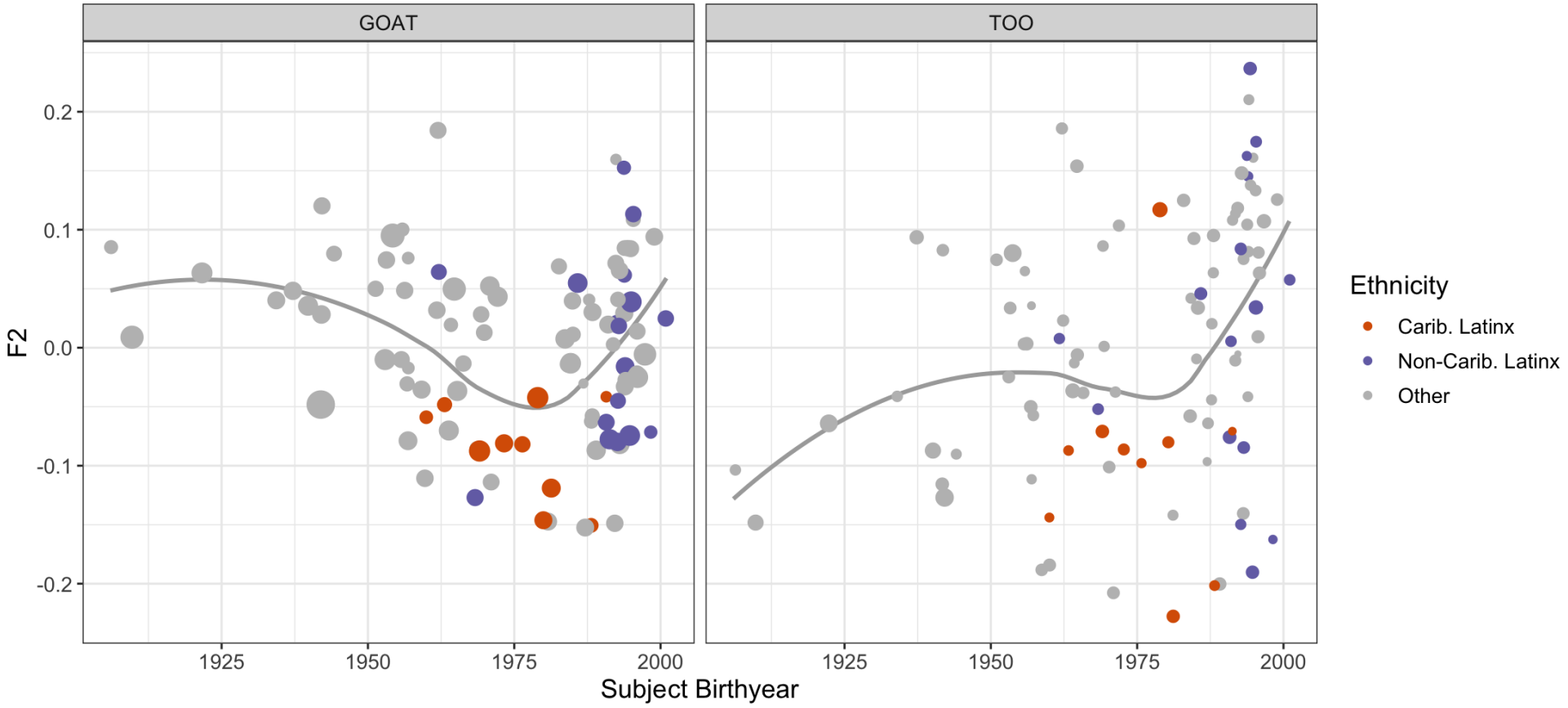

Figure 10: By-speaker random intercepts for GOAT and TOO.

Interim summary

i. Fronting of TOO, HOOP, GOAT, FOOT beginning with subjects born >1975.

ii. Among younger speakers, no effects of occupation or gender.

iii. No strong ethnicity effects, but some evidence that Caribbean Latinx subjects lagging behind other groups.

Change in short-a

- A question that arises is whether BVF correlates across speakers with another innovation in NYCE, namely the loss of traditional set of tensing rules for short-a in favor of a nasal system.
- The complex set of tensing rules traditionally described for NYCE (the Tragerian system) appears to be undergoing simplification (Becker and Wong, 2010; Becker, 2010; Newman, 2014; Newlin-Łukowicz, 2015, 2016; Coggshall, 2017; Shapp, 2018).
- The nasal rule:
  /æ/→ [tense]/ _____ [nasal]

Tragerian system

- Complex set of constraints (Trager, 1930; Labov, 1966, 1994, 2007; Becker, 2010).
- Lax unless followed by tautosyllabic:
  - Front nasals (*ham, hand*).
  - Voiced stops and affricates (*bag, badge*).
  - Voiceless fricatives (*math, fast*).
- Tense in syllables closed by inflectional morpheme boundaries (*planning*).
- Lax word-initially (with lexical exceptions, e.g. *ask, after*).

p		t	č	k
b		d	ǰ	g
m		n		ŋ
f	θ	s	š	
v	ð	z	ž	
		l	r	

Figure 11: Tautosyllabic following sounds triggering tensing.

Change in short-a

- Previous results suggest that social conditions on short-a change are different from those on BVF. One is that short-a change, unlike BVF is strongly conditioned by Ethnicity, with non-whites leading the change (Becker, 2010; Becker and Wong, 2010; Haddican et al., 2018).
- Back vowels are also not prominent in dialect performances or metalinguistic representations of NYCE speech (Singler, 2017; Cutler, 2018).
- Short-a reorganization seems to have begun earlier, i.e. with speakers born before 1975 (Haddican et al., 2018). Considerable cross-speaker variability in /æ/ tensing for older speakers (Coggshall, 2017).

The demise of the Tragerian system

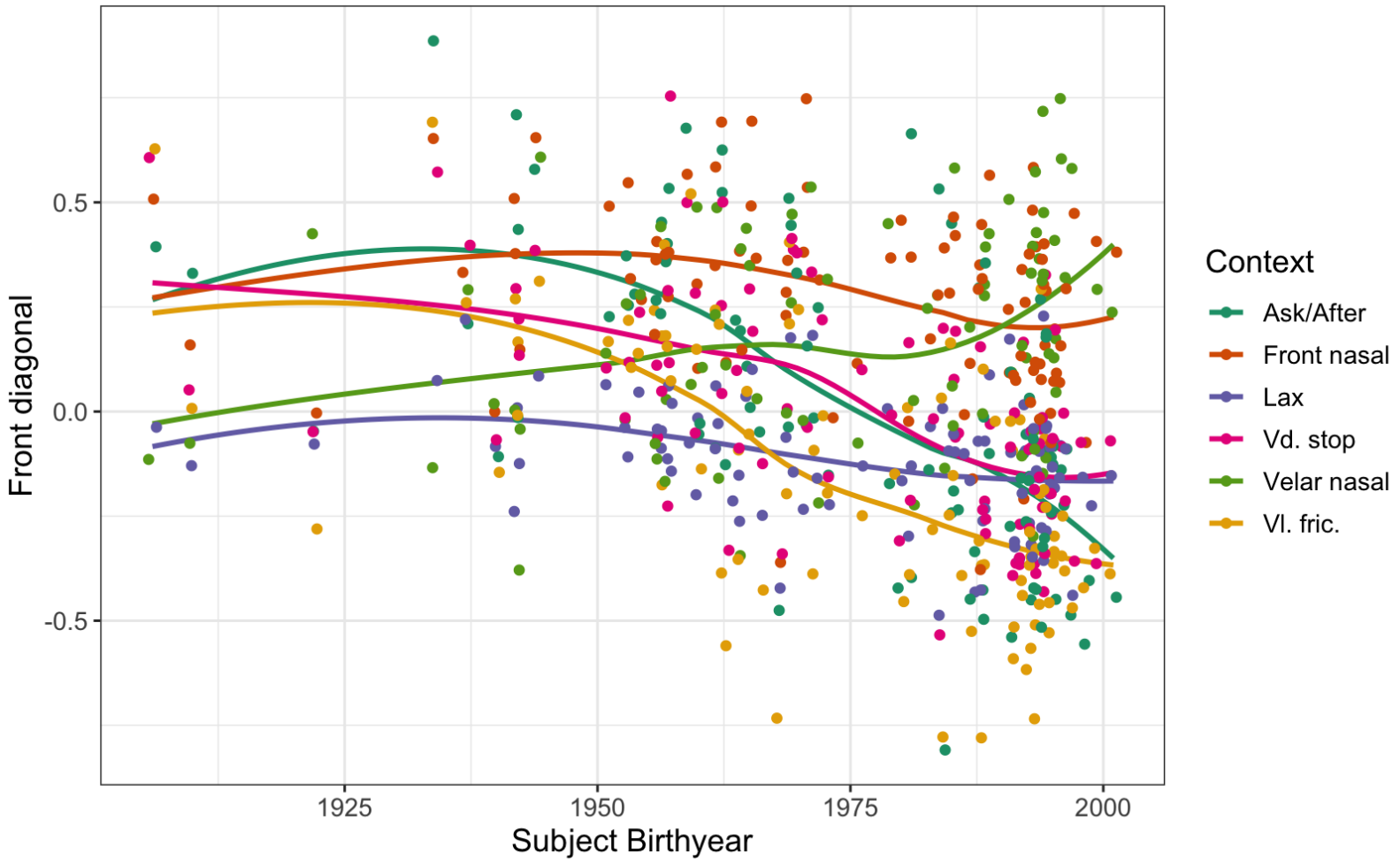

Figure 12: Mean F2-F1 by subject birthyear and tensing context.

Cross-speaker correlations with short-a change

- And indeed, there is a negligible cross speaker correlation between fronting TOO, GOAT and laxing LAUGH, BAN, BAG.
- The fact that BVF seems to be conditioned more weakly by ethnicity and class than THOUGHT-lowering and short-a laxing may reflect the former being indexically outcompeted (Wong and Hall-Lew, 2014).

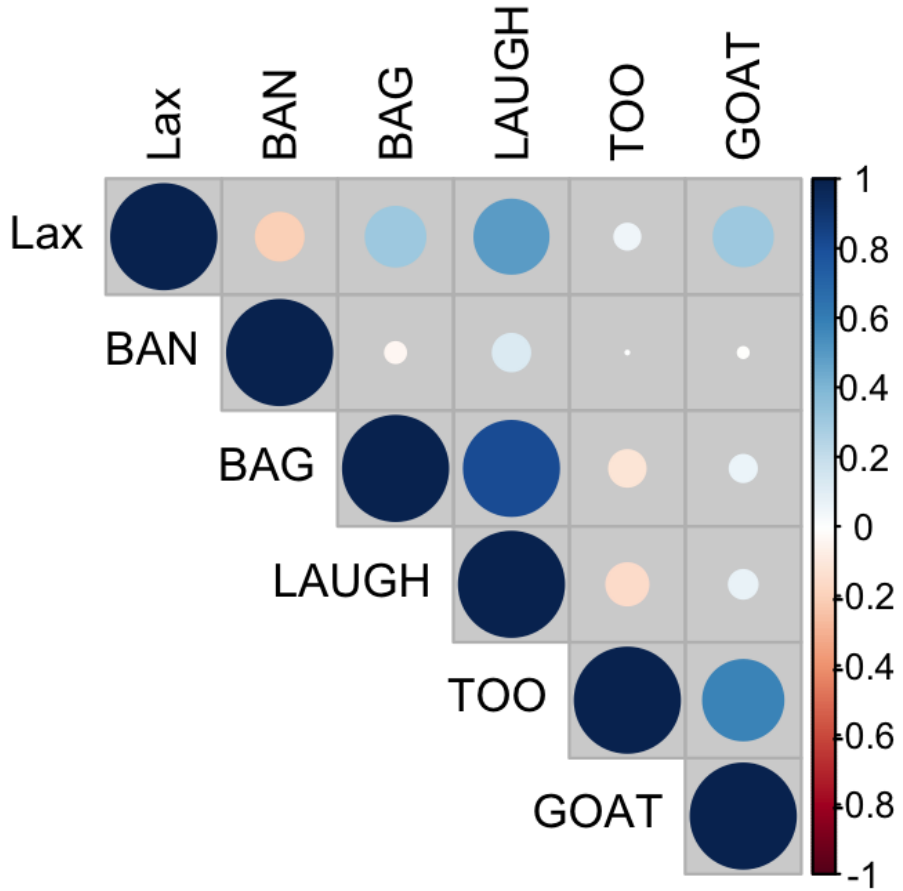

Figure 13: Correlation matrix of by-speaker model estimate for six features for 43 speakers born > 1975.

Lexical effects at word and lemma level

- Lexical memory effects on phonetic production typically modeled as properties of word, less frequently as properties of lexical root/lemma (Gahl, 2008; Drager, 2011). The latter findings suggest there are phonetic correlates of lexical roots independent of effects for word and phoneme/category.
- Typical comparison used to see this are homophones, e.g. *time* $\sim$ *thyme* and different categories of *like* (Gahl, 2008; Drager, 2011).
- Here we consider /o/-/u/ ablaut pairs, e.g. *throw-threw*.

Lexical effects at word and lemma level

- For older speakers in our sample (born $\leq$ 1975) there is TOO fronting without GOAT fronting.
- For these speakers, one might imagine that phonetic properties of one member of the ablaut pair is affected by its lexical relationship with the other member of the pair.
- Specifically, two expectations:
  i. GOAT-items participating in an ablaut pair (*know*) might show some fronting relative to non-ablaut GOAT items (*no*).
  ii. Conversely, for TOO, *knew* might show backing relative to *new*.
- **Pairs:** *throw-threw*, *know-knew*, *blow-blew*, *grow-grew*, *chose-choose*, *flow-flew*, *cold-cool*, *don't-do*, *move-motion*.

GOOSE-items

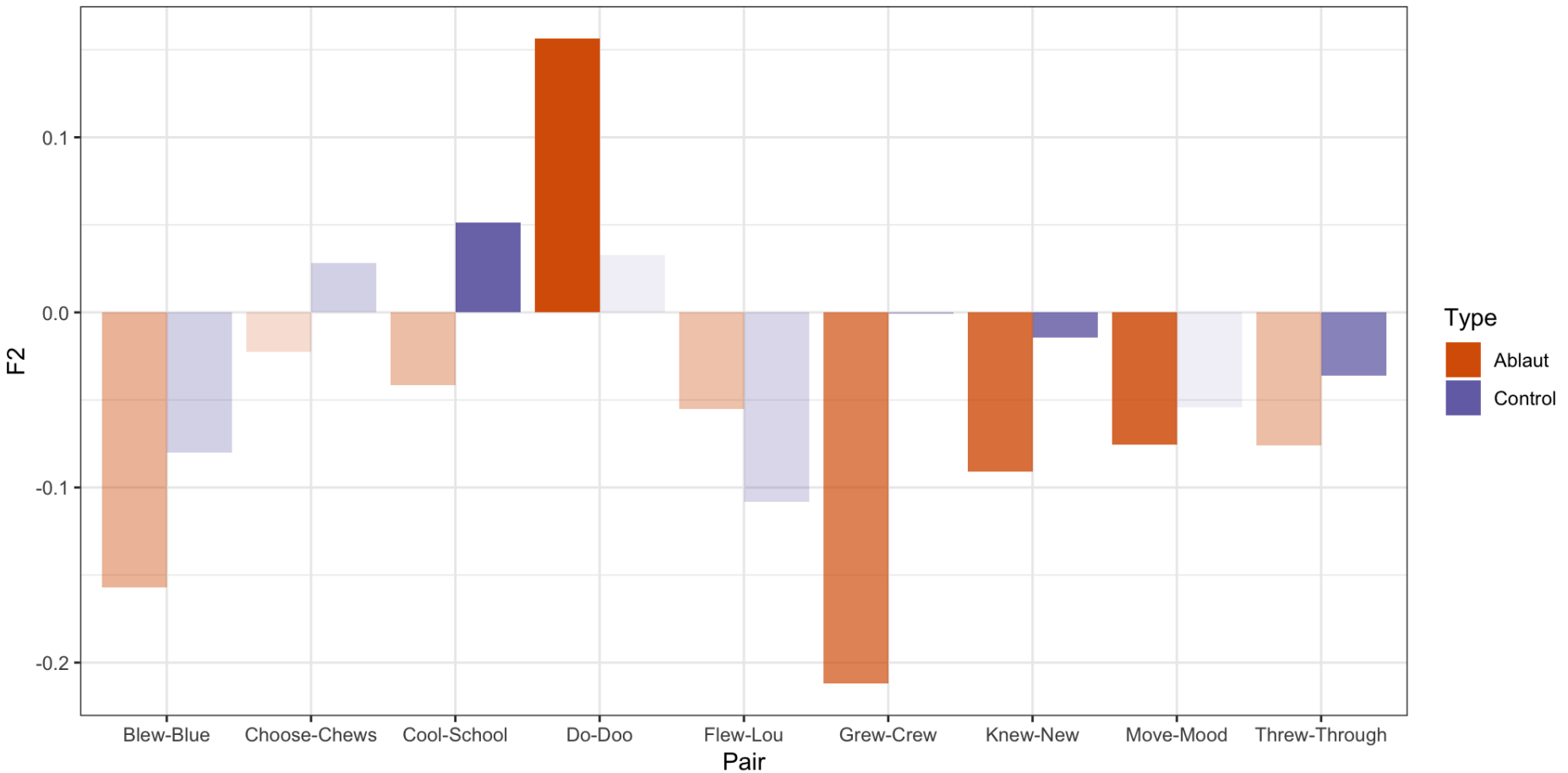

Figure 14: Random intercepts for word in model of /u/-fronting.

GOAT-items

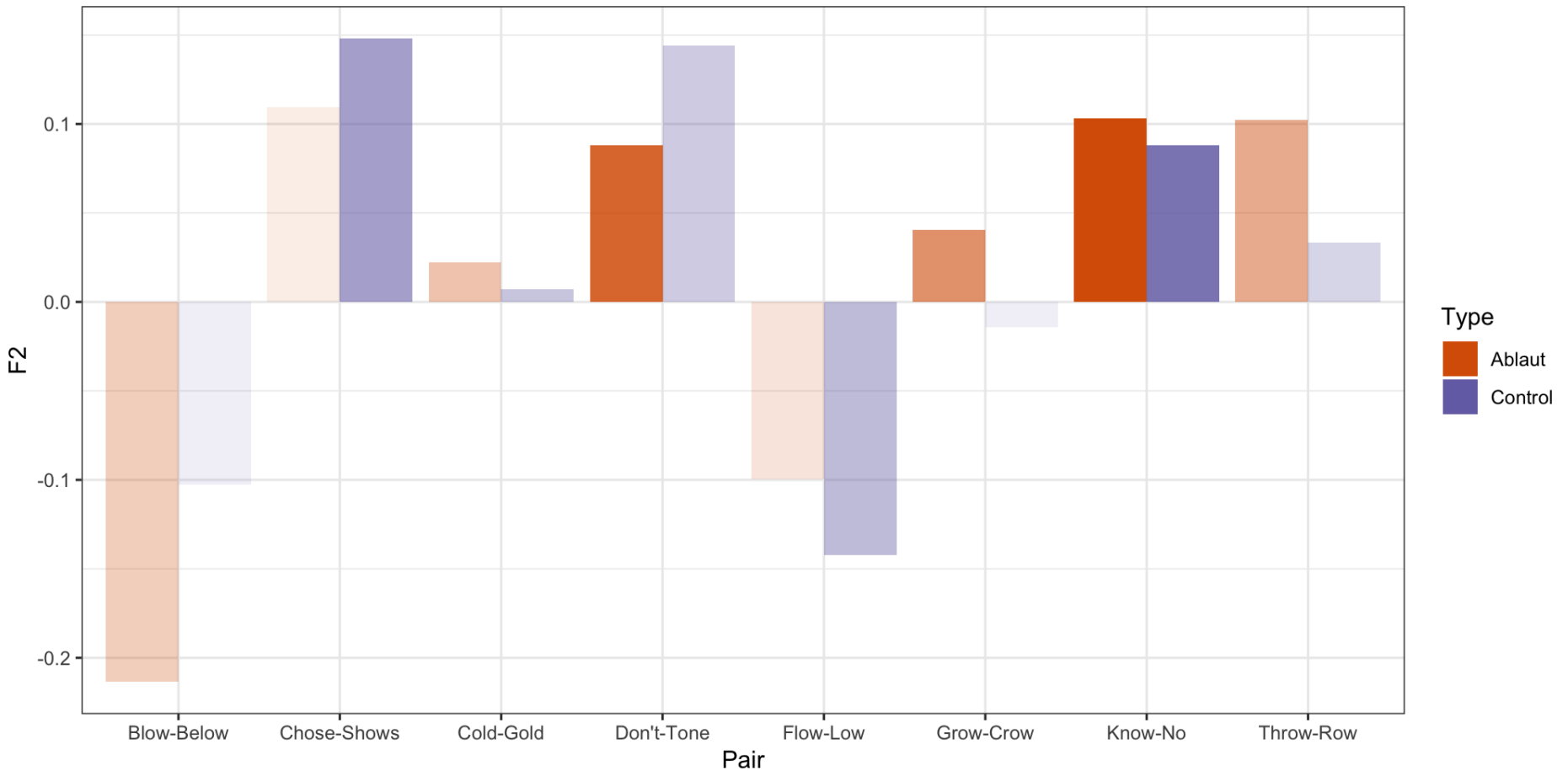

Figure 15: Random intercepts for word in model of /o/-fronting.

Lemma-level effects

- Most contrasts headed in direction predicted, however:
  i. In some cases, the data are sparse.
  ii. Frequency not included as predictor in modeling.
  iii. Most of the controls are non-homophones.

Main claims

Two main claims:

i. BVF is here. Fronting of vowels in TOO, HOOP, GOAT and FOOT lexical sets starting with speakers born > 1975.

ii. Unlike in changes in short-a contexts, BVF shows no strong effects of class. No ethnicity effects with possible exception of Caribbean Latinx groups.

Many thanks to . . .

- Jim Stanford.
- Paul Foulkes.
- Smart, hard-working undergraduate collaborators at QC, CSI and Lehman.
- NSF (BCS-1630286, BCS-1152148).

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